

(d) REMARKS

The claims are 17-21 with claim 17 the sole independent claim. Former claims 9, 14 and 15 have been rewritten as new claims 17-19. Support for new claim 17 is found in paragraph [0033] of the published U.S. Application No. 2004/0077249A1. Support for claim 18 is found at paragraph [0030]; support for claim 20 is found at paragraph [0029] and support for claim 21 is found at paragraph [0032]. New claim 19 corresponds to former claim 15.

The Examiner had rejected former claims 9 and 14 as obvious over Inaba '403 in view of Garvey '336. Former claims 15 and 16 were rejected as obvious over the same combination of references and further in view of Ishikura '033. The Examiner admits, with regard to claim 9, that Inaba fails to teach a pressure control means for keeping the pressure in the first chamber greater than the pressure in the second chamber. The grounds of rejection are respectfully traversed.

Prior to addressing the grounds of rejection, Applicants wish to briefly review certain key features and advantages of the present claimed invention.

The present invention relates to an apparatus adapted to transport carbon fibers within a tube connecting a generation chamber and a film-forming chamber via a difference in pressure between the generation chamber and the film-forming chamber and to deposit the carbon fibers on a substrate. According to the present invention, having a pressure difference between the generation chamber and the film-forming chamber causes both gas introduced into the generation chamber and the generated carbon fiber, to flow. The flow resulting from the pressure gradient orients the carbon fiber in the lengthwise

direction parallel to the direction in which the carbon fiber is transported. Since the carbon fiber is oriented lengthwise in the direction of flow, the fiber is transported readily.

Blowing carbon fibers whose lengthwise direction is oriented in the direction of transportation towards an electrode on the substrate enables the ends of the carbon fibers to impact the substrate to provide for better contact. Further, the carbon fiber can be deposited on the substrate so that the lengthwise direction of the carbon fiber will be approximately perpendicular to the substrate. By using such a deposited carbon fiber in an electron emission member for an electron-emitting device one enables high magnetic field intensity to be applied to the ends of the carbon fiber and high current density to be obtained.

Neither Inaba nor Ishikura discloses depositing a film of carbon fibers. As disclosed in column 9, line 25 to column 10, line 11, Inaba '403 teaches a plasma processing apparatus having a duct as well as a cathode connected to a target having a carbon source and a striker. Inaba teaches forming carbon ions and particles, not carbon fibers. A processing chamber is present which includes the processed substrate and a filter between the duct and the processing chamber. However, Inaba '403 does not teach depositing a carbon fiber on a substrate. No aerosol unit is employed, no transportation tube with a nozzle is utilized and no pressure control means is employed. The defects of Inaba are not met by Garvey '336.

As described in column 9, line 25 to column 10, line 11, Garvey '336 discloses an apparatus comprising a low vacuum chamber including an anode and a cathode opposed to the anode and a high vacuum chamber including a substrate for

forming a thin film by controlling the pressure in the low vacuum chamber to be greater than that in the high vacuum chamber. Garvey also discloses that the low vacuum chamber and the high vacuum chamber are connected through an opening. A “high vacuum” chamber has a lower pressure than a “low vacuum” chamber.

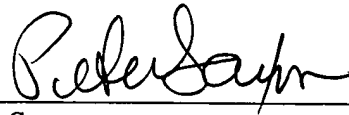
Garvey does not disclose a transporting tube with a nozzle for transporting a carbon fiber connecting the low vacuum chamber and the high vacuum chamber. Garvey also fails to teach a unit for forming an aerosol. Therefore, Garvey does not teach or suggest the advantages of the present invention of providing a pressure difference between the tube and the processing chamber and orienting the lengthwise direction of the carbon fiber along the direction of transportation while transporting the carbon fiber in the transporting tube so as to eject the carbon fiber onto the substrate to improve contact and adhesion between the carbon fibers and the substrate.

Ishikura teaches forming metallic particles, not carbon fibers, in a gas. Ishikura does not disclose or suggest an aerosol stream of carbon fibers which forcefully contact and form a vertically oriented electrode on a substrate.

Accordingly, Applicants submit that none of the references, whether considered alone or in combination, discloses or suggests the present claimed invention nor renders it unpatentable. Accordingly, it is respectfully requested that the claims be allowed and that the case be passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Peter Saxon", written over a horizontal line.

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